Volunteer Lake Assessment Program Individual Lake Reports

MILLEN POND, WASHINGTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	832	**Max. Depth (m):**	12.6	**Flushing Rate (yr^{1})**	0.7
Surface Area (Ac.):	156	**Mean Depth (m):**	5	**P Retention Coef:**	0.71
Shore Length (m):	5,000	**Volume (m^3):**	3,185,500	**Elevation (ft):**	1582

TROPHIC CLASSIFICATION

Year	Trophic class
1984	OLIGOTROPHIC
1997	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

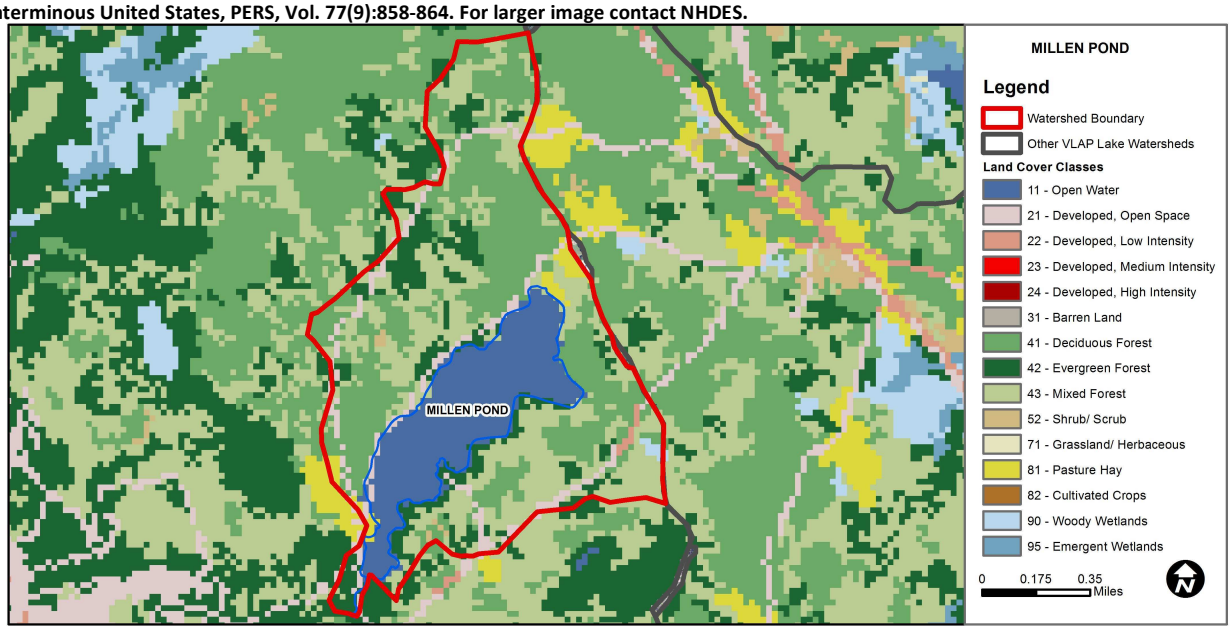
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

MILLEN POND - TOWN BEACH	Escherichia coli	Good	There are geometric means and all geometric means are < geometric mean criteria; and there has been a single sample exceedance.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	19.5	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	5.73	Deciduous Forest	32.21	Pasture Hay	1.71
Developed-Low Intensity	0.33	Evergreen Forest	12	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	27.86	Woody Wetlands	0.27
Developed-High Intensity	0	Shrub-Scrub	0.3	Emergent Wetlands	0

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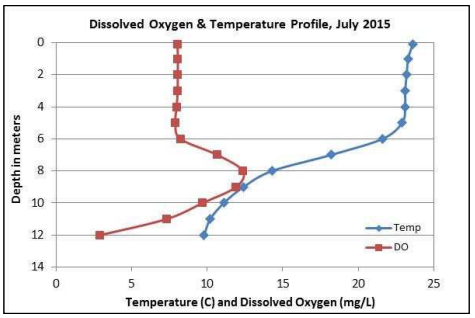
Millen Pond, Washington

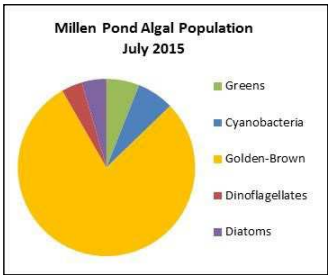
2015 Data Summary

Recommended Actions: Water quality in the pond is very good and representative of oligotrophic, or high quality water, conditions. Epilimnetic phosphorus and transparency have become more variable in recent years potentially due to the increased frequency and intensity of storm events and the resulting stormwater runoff. Assess dirt and gravel roads and shoreline properties for signs of erosion during storm events and utilize DES' "NH Homeowner's Guide to Stormwater Management" as a resource to install best management practices to control stormwater runoff. Keep up the great work!

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were stable and low from June through September. Average chlorophyll levels decreased slightly from 2014 and was much less than the state median. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** Deep spot, Inlet and Outlet conductivity levels remained stable and low and were slightly less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic (upper water layer) conductivity since monitoring began.
- **Total Phosphorus:** Deep spot and Inlet phosphorus levels were stable and low from June through September. Average epilimnetic phosphorus decreased from 2014 and was much less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since monitoring began. Outlet phosphorus levels increased as the summer progressed but remained within a low to average range.
- **Transparency:** Transparency was high (good) in 2015 and was the best measured since monitoring began! Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **Turbidity:** Epilimnetic and metalimentic (middle water layer) turbidities were stable and low from June through September. Hypolimnetic (lower water layer) turbidity was low in June and July and then increased in September. Inlet and Outlet turbidities were low.
- **pH:** Deep spot, Inlet and Outlet pH levels were generally less than the desirable range 6.5-8.0 units and potentially critical to aquatic life. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **Dissolved Oxygen/Temp:** Dissolved oxygen levels were generally within a good range throughout the water column. Dissolved oxygen spiked between 6 and 10 meters indicating algal growth in that zone.





Station Name	Table 1. 2015 Average Water Quality Data for MILLEN POND							
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
					NVS	VS		
Epilimnion	2.9	1.38	33.0	3	7.44	8.21	0.56	6.33
Metalimnion			32.9	4			0.59	6.42
Hypolimnion			32.9	7			0.88	6.00
Inlet 2			33.1	3			0.49	6.39
Outlet In Stream			36.9	9			0.70	6.17

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Improving	Data significantly decreasing.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.